

What is Claimed Is:

1. A material conveyance apparatus comprising:

a belt having a first side edge, a second side edge, first magnets secured relative the first side edge and second magnets secured relative the second side edge;

a first support structure having third magnets; and

a second support structure having fourth magnets;

wherein the belt is disposed with respect to the first and second support structures such that a magnetic force between the first magnets and the third magnets supports the first side edge, and a magnetic force between the second magnets and the fourth magnets supports the second side edge.

2. The material conveyance apparatus of claim 1 wherein a lateral direction is defined between the first side edge and the second side edge, wherein the magnetic forces supporting the side edges include components in said lateral direction.

3. The material conveyance apparatus of claim 2 further comprising at least one lateral support device coupled to the first support device and the second support device to create lateral outward force between the first support device and the second support device.

4. The material conveyance apparatus of claim 3 wherein the at least one lateral support device includes a flexible length device allowing the distance between the first support device and the second support device to vary.

5. The material conveyance apparatus of claim 4 further comprising:

- a first longitudinal member secured to the first support structure to provide vertical support thereto;
- a second longitudinal member secured to the second support structure to provide vertical support thereto;
- a cross member secured to the first longitudinal member and the second longitudinal member to provide lateral support to both longitudinal members.

6. The material conveyance apparatus of claim 5 wherein a first lateral support device provides lateral force between the first longitudinal member and the second support structure, and a second lateral support device provides lateral support between the second longitudinal member and the first support structure.

7. The material conveyance apparatus of claim 1 further comprising:

- a longitudinal member disposed beneath and between the first support structure and the second support structure;
- a first arm pivotably secured to the longitudinal member and also secured to the first support structure;
- a second arm pivotably secured to the longitudinal member and also secured to the second support structure.

8. The material conveyance apparatus of claim 7 further comprising a lateral support member coupled between the first arm and the second arm and providing a force pushing the first arm away from the second arm.

9. The material conveyance apparatus of claim 1 wherein at least the third and fourth magnets are electro-magnets which have variable magnetic properties that can be modulated by the application of an electric signal.

10. A support device for use with a conveyor belt, the support device comprising:

a first magnet; and

a first tension member;

wherein said first magnet is disposed such that the conveyor belt supported thereby can receive both vertical and lateral support from said first magnet, and wherein said first tension member is coupled to said first magnet to provide lateral tension to the conveyor belt supported by said first magnet.

11. The support device of claim 10 further comprising:

a second magnet; wherein said first magnet is disposed on a first lateral side of the conveyor belt and said second magnet is disposed on a second lateral side of the conveyor belt, and said first tension member pushes said first magnet away from said second magnet.

12. The support device of claim 11 wherein the support device is adapted for use with a conveyor belt having third and fourth magnets disposed on the lateral sides of the conveyor belt.

13. The support device of claim 11 further comprising a first support arm coupled to the first magnet, wherein the first tension member applies a force to the first support arm.

14. The support device of claim 13 further comprising a second support arm coupled to the second magnet, wherein the first tension member also applies a force to the second support arm.

15. The support device of claim 13 further comprising
a second support arm coupled to the second magnet; and
a second tension member coupled to the second support arm, wherein the second tension member applies a force to the second support arm, a lateral component of the force applied by the second tension member being opposed to a lateral component of the force applied by the first tension member.

16. A materials conveyance apparatus comprising:
a belt having a first side edge and a second side edge, each side edge including a number of engaging devices including a number of magnets;

a first support rail including a number of magnets adapted to be engaged by the engaging devices; and

a second support rail including a number of magnets adapted to be engaged by the engaging devices;

wherein the belt is disposed with respect to the support rails such that the magnets of the support rails repel the magnets of the engaging devices.

17. The apparatus of claim 16 further comprising a tension member disposed with respect to at least one of the support rails to cause lateral tension in the belt between the first side edge and the second side edge.

18. The apparatus of claim 17 further comprising a roller disposed with respect to the belt to provide vertical support to the belt.

19. The apparatus of claim 16 further comprising an electrical connection to at least one of the number of magnets, wherein the electrical connection and a magnet coupled to the electrical connection are adapted to vary the magnetic field created by the magnet.